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KIM, CHONG R				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

09/586,869

**Applicant(s)**

HARMAN, PHILIP VICTOR

**Examiner**

CHARLES KIM

**Art Unit**

2624

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14, 18-23, 27-33, 35 and 43-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 18-23, 27-33, 35 and 43-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on November 12, 2008 has been entered.

### ***Response to Amendment and Arguments***

2. Applicant's amendment filed on November 12, 2008 has been entered and made of record.
3. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicant argues that their claimed invention (claim 1) differs from the prior art because "Kawabata lacks a teaching or suggestion of outlining at least one object within a 2D image without using distance measurement data." (Response, p. 8). According to Applicant, Kawabata's disclosure of determining a contour "is different from outlining an object" because a contour "is a curve connecting points in a function of two variables where the function has the same particular value." (Id.). The Examiner disagrees.

Applicant provides no support for their very narrow definition of a contour. Nothing in Kawabata suggests that a contour is limited to such a restrictive definition. Instead Kawabata explains that a contour is determined by analyzing pixels having high contrast. (Kawabata, col. 6, ll. 37-42). The Examiner notes that it was well known for high contrast pixels and an outline to go hand-in-hand. Hence, Kawabata's method of determining the contour suggests that his contour is analogous to an outline. Moreover, the term "contour" is defined by the Webster's Collegiate Dictionary as an outline or a line representing an outline<sup>1</sup>. In light of the above, Examiner construes Kawabata's disclosure of determining a contour of an object as being analogous to determining an outline of the object, as recited in claim 1.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claim(s) 1-14, 18-23, 27-33, 35, 43-51 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Federal Circuit precedent<sup>2</sup> requires that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another

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<sup>1</sup> Merriam-Webster's Collegiate Dictionary 250 (10<sup>th</sup> ed. 2001)

<sup>2</sup> *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process under 35 U.S.C. 101.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 13-14, 19-20, 27, 32, 33, 35, 43-44, 46-49 are rejected under 35

U.S.C. 102(e) as being anticipated by Kawabata, U.S. Patent No. 6,370,262 (“Kawabata”).

Referring to claim 1, Kawabata discloses a method of producing a depth map comprising the steps of:

a. identifying and outlining at least one object within a 2D image without using distance measurement data [col. 6, lines 19-42 and figure 2. Kawabata explains that the contour of the object O is determined based on contrast data.];

b. allocating an identifying tag to the at least one object [col. 6, lines 48-53. Note that the address, representing the x-y coordinate of the object, is interpreted as the identifying tag.];

c. allocating a depth tag to the at least one object [col. 6, lines 21-53 and figure 2. Kawabata discloses determining the distance of the object, which is 2m in the example given.];

d. determining and defining an outline (contour) of the at least one object [col. 6., lines 19-53. Kawabata discloses determining which positions in the blocks, for which the distance measurements are calculated, correspond to the pixels portions in the contour part. This correspondence is construed as determining and defining an outline of the object.]; and

e. encoding the identifying tag, the depth tag and the outline, of the at least one object to produce a depth map [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the identifying tag (address), depth tag (distance data), and outline (contour) of the object.].

Referring to claim 2, Kawabata further discloses that the object outline is defined by a series of coordinates [col. 6, lines 44-48].

Referring to claim 3, Kawabata further discloses that the identifying tag is a unique number [col. 6, lines 48-53].

Referring to claim 13, Kawabata further discloses that the depth tag is a numerical value [col. 6, lines 18-24 and figure 2B].

Referring to claim 14, Kawabata further discloses that the numerical value ranges from 0 to 255 [col. 6, lines 21-24 and figure 2B].

Referring to claims 19-20, Kawabata further discloses adding a texture bump map to the object, wherein the texture bump map is defined by breaking the at least one object into a plurality of components and assigning a separate depth tag [fig. 2b. Note that the object is broken into a plurality of components and assigned a separate depth tag.].

Referring to claim 27, see the rejection of claim 1 above. Kawabata discloses a method of encoding a depth map including:

- a. allocating an object identifier (address) to an object without using distance measurement data [col. 6, lines 37-53];
- b. allocating a depth tag to the object, including allocating a depth function, and allocating a depth for the object [col. 5, ll. 8-14 and col. 6, lines 21-24 and figure 2B. Note that the distance calculation method is construed as a depth function.];
- c. defining an outline (contour) of the object [col. 6, lines 40-53]; and
- d. producing a depth map by encoding the depth tag and the outline of the object [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the depth tag (distance data) and the outline (contour) of the object.].

Referring to claim 32, Kawabata further discloses that the object outline is defined by at least one geometric shape [figure 2C].

Referring to claim 33, Kawabata further discloses that the geometric shape is defined by the form of the shape and the parameters of the shape [col. 6, lines 31-53].

Referring to claim 35, Kawabata further discloses that the depth function includes single value [col. 5, ll. 8-14].

Referring to claim 43, Kawabata further discloses a method of converting 2D images into stereoscopic images applying a depth map generated above (claim 1) [col. 5, lines 8-15, col. 6, lines 18-64].

Referring to claim 44, Kawabata further discloses a method of converting 2D images into stereoscopic images applying a depth map generated above (claim 27) [col. 5, lines 8-15, col. 6, lines 18-64].

Referring to claim 46, see the rejection of at least claim 27 above.

Referring to claim 47, see the rejection of at least claim 35 above.

Referring to claim 48, see the rejection of at least claim 19 above.

Referring to claim 49, see the rejection of at least claim 20 above.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Matsugu et al., U.S. Patent No. 6,167,167 ("Matsugu").

Referring to claim 5, Kawabata does not explicitly disclose that the step of determining the outline further includes tracing the at least one object pixel by pixel. However, this feature was exceedingly well known in the art. For example, Matsugu discloses the step of determining an outline of an object by tracing the object pixel by pixel [col. 15, line 35-col. 16, line 61].

Kawabata and Matsugu are combinable because they are both concerned with image processing methods that determine the outline of an object. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawabata's outline determining step in view of Matsugu. The suggestion/motivation for doing so would have been enhance the accuracy of the outline detection process by using a tracing technique [Matsugu, col.



3, line 4-6]. Therefore, it would have been obvious to combine Kawabata with Matsugu to obtain the invention as specified in claim 5.

7. Claims 6-10, 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Meek et al. U.S. Patent No. 6,029,173 ("Meek").

Referring to claims 6-8, Kawabata does not explicitly disclose that the step of determining the outline further includes using straight lines, curve approximations, or Bezier curves to approximate the outline of the at least one object. However, these features were exceedingly well known in the art. For example, Meek discloses a step of determining an outline that includes a using straight line, curve, and Bezier curve approximations to approximate the outline of the at least one object [column 6, line 20-30]. The Examiner notes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a straight line, curve, and Bezier curve approximations to approximate an outline as taught by Meek. The reason for doing so would have been to minimize the storage requirements while providing a high level of accuracy in the representation of other-than-straight (curved) features [Meek, column 4, line 32-46]. Therefore, it would have been obvious to combine Kawabata with Meek to obtain the invention as specified in claims 6-8.

Referring to claim 9, Kawabata does not explicitly disclose that the step of determining the outline further includes comparing the object with a library of curves and/or generic geometric shapes to approximate the outline. However, this feature was exceedingly well known in the art. For example, Meek discloses a method and system for representation and use of shape

information in geographic databases wherein a step of determining an outline (shape) includes comparing (matching) the object with a library of curves [column 8, line 50-64] and/or generic or geometric shapes to approximate the outline [column 6, line 14-30; column 8, line 20-48]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to compare the object with a library of curves and/or generic geometric shapes as taught by Meek. The reason for doing so would have been to approximate the outline and minimize the storage requirements while providing a high level of accuracy in the representation of other-than-straight (curved) features [Meek, column 4, line 32-46].

Referring to claim 10, Meek further discloses that the curve and/or generic or geometric shape are scaled to best fit the object [column 8, line 50-64].

Referring to claim 28, Kawabata does not explicitly disclose that the object outline is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve. However, this feature was exceedingly well known in the art. For example, Meek discloses an object outline that is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve [figure 5]. Therefore, it would have been obvious to combine Kawabata and Meek, for the reasons stated above.

Referring to claim 29, Meek discloses further that each curve (other-than-straight segment) is stored in a library and allocated a unique numerical number (index reference value) [column 8, line 60-64].

Referring to claim 30, Meek further discloses that the object outline also includes data on the orientation (rotation) of each curve [column 8, line 50-64].

Referring to claim 31, Meek discloses that each curve is a Bezier curve [column 6, line 14-30].

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Nourbakhsh et al., U.S. Patent No. 5,793,900 ("Nourbakhsh").

Referring to claims 11-12, Kawabata does not disclose that the depth tag includes a color code, wherein white represents one of objects relatively close to the viewer, or objects relatively distant from the viewer and black represents the other. However, this feature was exceedingly well known in the art. For example, Nourbakhsh discloses generating categorical depth maps using passive defocus sensing wherein a depth map is an array of categorical depth values, each value indicating the depth of the scene for a given region such that depth values of 2, 1, and 0 correspond to close, medium, and far, respectively [column 5, line 9-15]. Nourbakhsh further discloses that close regions are lightly shaded, medium regions are medium shaded, and far regions are darkly shaded [Figures 2-7; column 5, line 20-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent objects relatively close to the viewer as white and objects relatively distant from the viewer with black, as taught by Nourbakhsh. The reason for doing so would have been to give the viewer an impression of depth using varying pixel intensities taking into account that brighter areas logically indicate a closer portion, which is easier to see, and darker areas indicate a distant portion, which is more difficult to see [Nourbakhsh, column 5, line 20-31].

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Eleftheriadis et al., U.S. Patent No. 6,055,330 ("Eleftheriadis").

Referring to claim 18, Kawabata does not explicitly disclose the step of tracking the at least one object on successive frames of the image, and determining and assigning depth tags for the at least one object in each respective frame. However, this feature was exceedingly well known in the art. For example, Eleftheriadis discloses the step of tracking at least one object on successive frames of an image, and determining and assigning depth tags for the at least one object in each respective frame [column 18, line 45-55. Eleftheriadis explains that the "objects are adequately tracked" on successive frames].

Kawabata and Eleftheriadis are combinable because they are both concerned with image processing systems for producing depth maps. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Kawabata in view of Eleftheriadis. The suggestion/motivation for doing so would have been to enhance the flexibility of the imaging system by providing tracking capabilities. Therefore, it would have been obvious to combine Kawabata with Eleftheriadis to obtain the invention as specified in claim 18.

10. Claims 21-23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabata, U.S. Patent No. 6,370,262 ("Kawabata").

Referring to claims 21-22, Kawabata does not explicitly disclose that the texture bump map is defined by luminance values of individual components of the at least one object or by chrominance, saturation, color grouping, reflections, shadows, focus, and/or sharpness of

individual components. However, Official Notice is taken that these types of texture bump maps were well known in the art. Therefore, it would have been obvious to modify Kawabata's method to include a texture bump map, as described above, in order to provide the user with additional information relating to the object.

Referring to claim 23, Kawabata does not explicitly disclose the step of producing grayscale images that are at a lower resolution than the 2D image. However, Official Notice is taken that producing images at a lower resolution was exceedingly well known in the art. Therefore, it would have been obvious to modify Kawabata's method to include the step of producing grayscale images that are at a lower resolution than the 2D image. The reason for doing so would have been to enhance the efficiency of the image storage/transmission process.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Snyder et al., U.S. Patent No. 6,326,964 discloses texture mapping including applying color, shadow, lighting and shading operations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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